



**MAXI® Remote Location Kit
MRLK 900**

Installation Instructions

Introduction

The **MAXI® Remote Location Kit 900** utilizes 900 MHz radios to position a MIM 2-Wire, MIM LINK or MDI at a remote location from the central computer. The MRLK 900 includes two surge protectors to provide in-line protection against lightning at the locations of both radios. These installation instructions assume that the user is already familiar with the installation instructions and physical layout of the MIM 2-Wire, MIM LINK, or MDI products. If further information is needed regarding these types of products, please refer to their appropriate manuals.

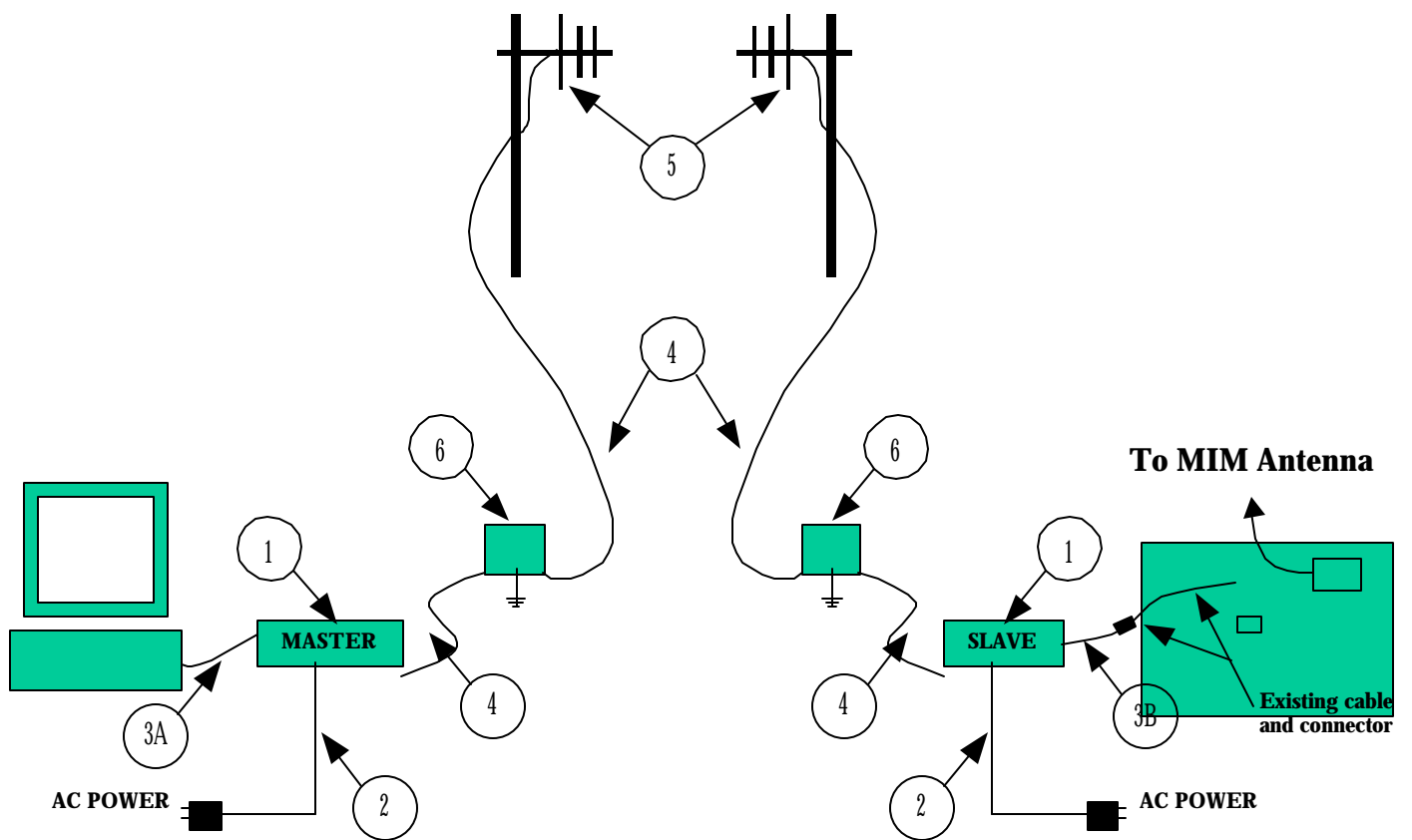
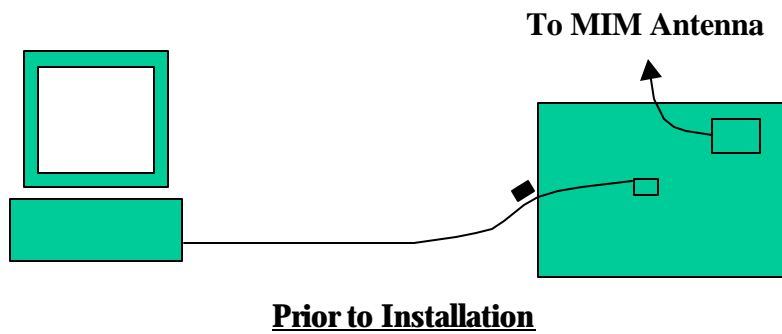
Materials Included

The MRLK 900 contains the following materials:

Find Number	Description	Quantity
1	902-928 MHz, 115 Kbaud Spread Spectrum wireless data transceiver in a ruggedized enclosure with a N type female RF connector (12 Volts)	2
2	Transformer Input: 120VAC 12W Output: 12VDC 500mA	2
3A	RS232 Interface Cable DB9 Male to DB9 Female	2
3B	RS232 Interface Cable – Null Modem DB9 Male to DB9 Male	1
4	20 Foot Coaxial Cable with male N type connectors (0.24" diameter, 2dB loss)	4
5	900-960 MHz 6dB 3 element Yagi directional antenna	2
6	PolyPhaser - Throughput Energy $\leq 220\mu\text{J}$ (typical) Frequency Range: 125MHz to 1000MHz Max. Power: VHF 375W, UHF _{Low} 125W 800MHz to 1GHz 50W	2

Setup

The following diagram in Figure 1 depicts a typical before and after configuration for the installation of the MRLK 900.



After MRLK 900 Installation

FIGURE 1

Radio Configuration

Prior to the installation of the MRLK 900, the FreeWave 900 MHz Spread Spectrum radios require configuration. All adjustments are done through the FreeWave setup program, a user interface which eliminates the need for setup diskettes, DIP switch settings, or custom software. The setup program is invoked by connecting the FreeWave radio to any terminal program, setting the computer baud rate to 19,200, and putting the radio into setup mode. The configuration can be performed using Microsoft's HyperTerminal program provided with most versions of Microsoft Windows.

The FreeWave radios operate in a Master/Slave configuration. Therefore, the radio used at the computer location will be setup as a master using the steps below, and the other will be setup as a slave used at the remote MIM location. As appropriate, the actions pertaining to the steps below will be highlighted accordingly to differentiate between the actions associated with a master configuration and those of a slave configuration.

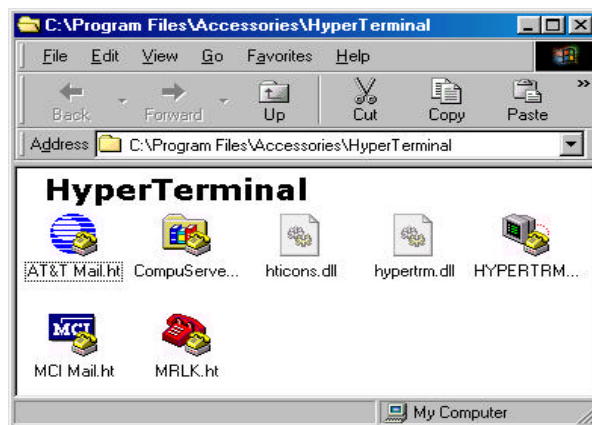
The FreeWave radios are pre-configured from the factory. One is configured as a point to point master, and the other is configured as a point to point slave. Many of the required parameters are also already configured, but they must be verified to ensure that the radios will communicate properly. A quick method for identifying the master prior to invoking the setup program is to power up the radio. Prior to establishing a communication link with a slave or repeater, all three of the master's LEDs will be solid red. Even though the middle LED "TX" may appear dimmer than the other LEDs, it should display at a level which is detectable from being completely off.

The radios can be configured using the following steps:

1. Connect one of the radios to the COM1 port of a computer using a RS232 cable. Provide power to the FreeWave radio using the supplied transformer.
2. Start Microsoft's HyperTerminal program in Windows from

Start ▶ Programs ▶ Accessories ▶ Communications.

3. Double-click on the **HYPERTRM** icon.



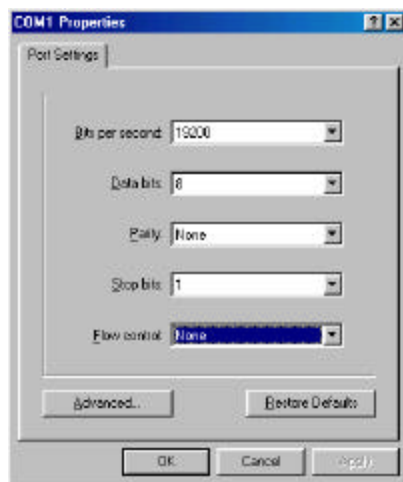
4. Enter a **Name** for the New Connection (temporary name).



5. Select “Direct to Com1” from **Connect Using** pull-down.

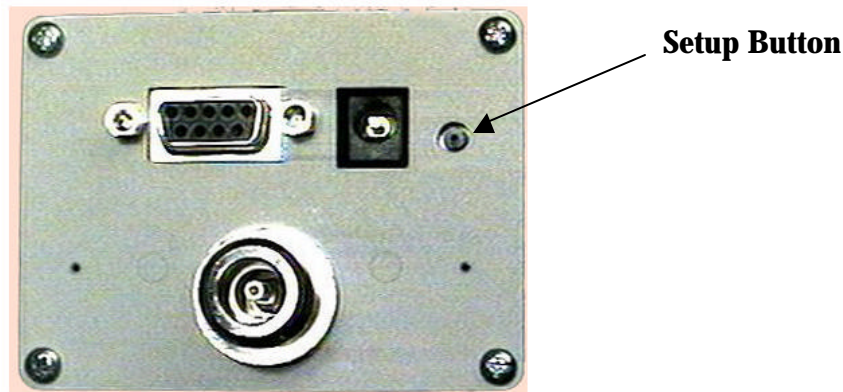


6. Select the following settings for the **COM1 Properties** window:



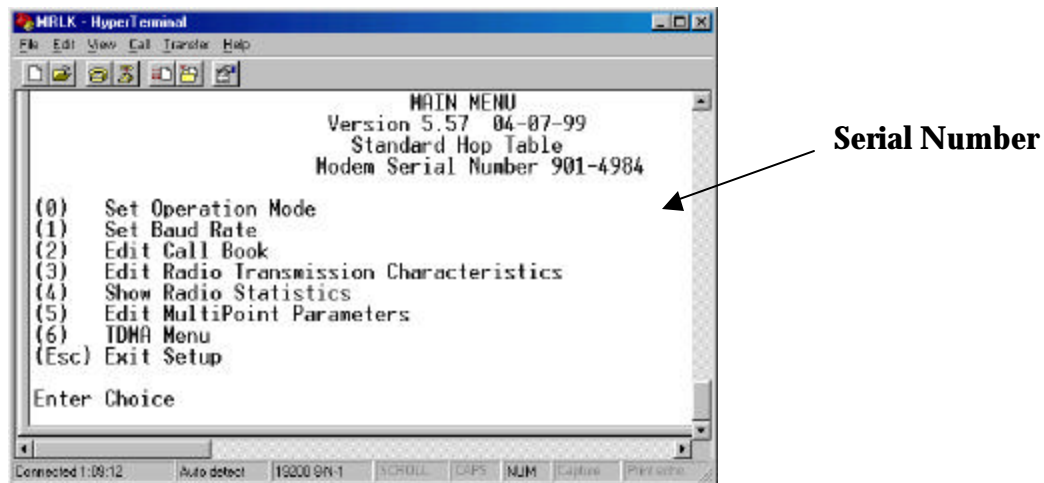
Bits per second: 19200
Data bits: 8
Parity: None
Stop bits: 1
Flow control: None

7. Invoke the setup program by pressing the black button on the back of the radio:



When the setup program is invoked, all three LEDs on the front panel of the FreeWave radio will turn green and will remain green for the entire time the radio is in setup mode.

8. Verify that the serial number on the setup program screen matches the serial number on the bottom of the FreeWave radio. In addition to providing the radio's unique serial number, the setup program provides a set of choices for editing the operational parameters and viewing the performance data.



Enter "0" to Set Operation Mode.

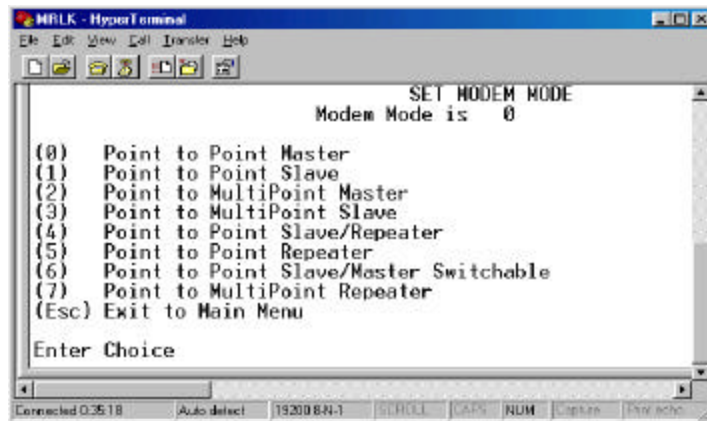
9. Verify that the radio displaying three solid LEDs after connecting power is configured as the master, and the other radio is configured as the slave. This can

be verified by checking the second line of text in the SET MODEM MODE menu as shown below. The second line of text should show the following:

For **Master** radio: Modem Mode is 0
For **Slave** radio: Modem Mode is 1

If the radios have not been pre-configured correctly for the Modem Mode, then configure each radio using the following:

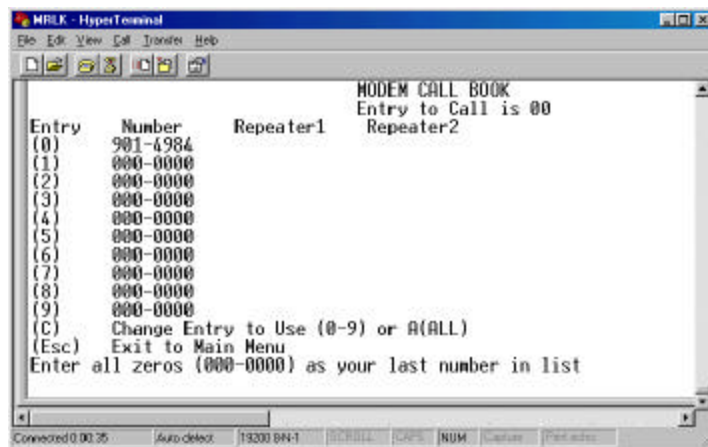
For **Master** radio: Enter "0" to select **Point to Point Master**.
For **Slave** radio: Enter "1" to select **Point to Point Slave**.



If the Modem Mode has been configured properly, then press **ESC** to return to the Main Menu.

10. Verify that each radio has been pre-configured to communicate with the other by checking the entries in the Call Book for each radio.

Enter “2” to Edit Call Book from the Main Menu.



For **Master** radio: The **Number** for Entry (0) should match the serial number found on the bottom of the Slave radio.

For **Slave** radio: The **Number** for Entry (0) should match the serial number found on the bottom of the Master radio.

To change the **Number** of an entry, enter the entry number followed by the seven-digit serial number. Do not enter a “-” after the third digit, the formatting of the number is automatic. For example, to enter the serial number 901-4984 into Entry (0), enter a “0” followed by “9014984” from the MODEM CALL BOOK menu.

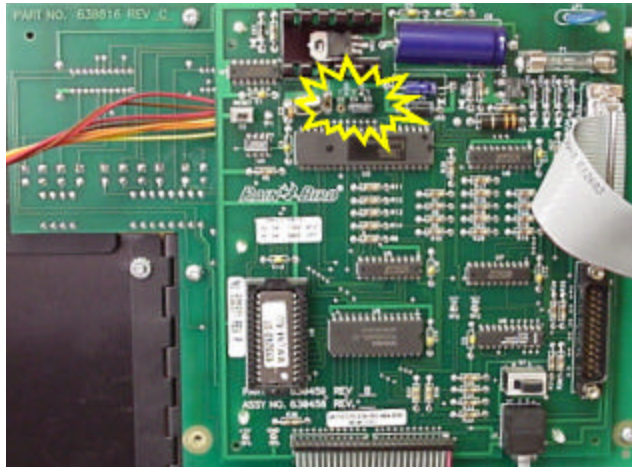
Verify that the Call Entry selection of each radio has been pre-configured to communicate with the other radio. This can be verified by checking the second line of text in the MODEM CALL BOOK menu as shown above. The second line of text should show the following:

Entry to Call is 00

If the second line of text does not show the same text as above, then select “C” followed by a “0” to change the selection to the (0) Call Entry.

Press **ESC** to return to the Main Menu.

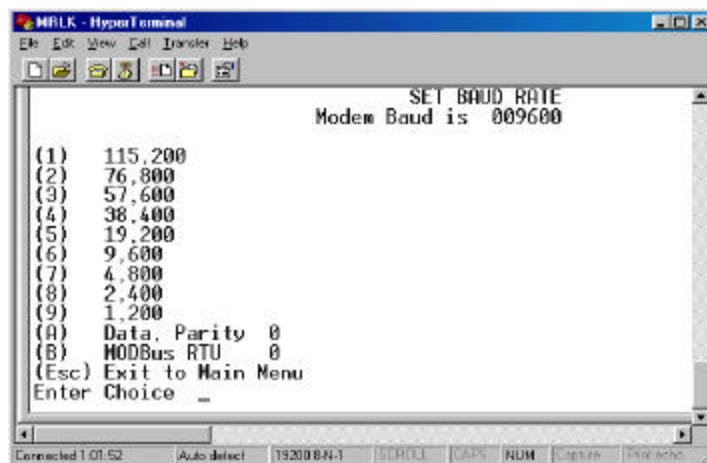
11. Determine the baud rate setting for the MIM by looking at the baud rate select jumper on the inside of the door as shown below. Use the table below to determine the selected baud rate of the MIM. The baud rate setting for an MDI application can be determined from the existing configuration.



Jumper	Baud Rate
E5 – E4	9,600
E4 – E3	1,200

12. Enter “1” to Set Baud Rate from the Main Menu.

From the Set Baud Rate Menu, enter a “6” - **9,600** or a “9” - **1,200** to match the baud rate setting determined from the previous step. This baud rate setting will be used to configure each radio.



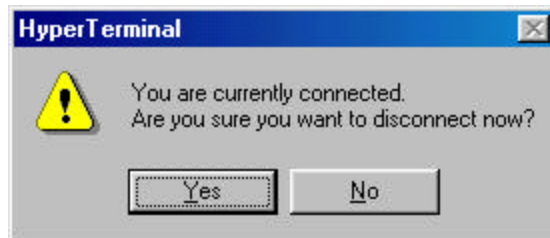
Press **ESC** to return to the Main Menu.

Press **ESC** to Exit Setup.

13. After completing the setup program for one of the radios, perform steps 7-13 for the other radio, making sure that the Operation Mode selection is set to the opposite mode of the other radio.

After configuring both radios, exit from the HyperTerminal program by closing the window or using the Exit selection in the File dropdown menu.

Select Yes to disconnect from the current session of HyperTerminal.



Yagi Antenna Installation

Prior to the installation of the radios and the antennas, disconnect the power to the MIM or MDI to prevent communication until the installation is complete. It is highly desirable to obtain a line of sight when mounting the Yagi directional antennas to increase the strength and reliability of the communication signal.

PolyPhaser Installation

A PolyPhaser surge protector must be installed at each radio location to provide in-line protection against lightning. Each of the PolyPhaser surge protectors must be grounded using a dedicated external grounding rod.